Motivational Interviewing Effects on Hypertensive Patients: A Randomized Controlled Trial Survey

Mohammad Reza Honarvar[1], Kamal Mirkarimi[2], Danial Bagheri[3], Aziz Kamran[4]

[1] School of Public Health, Iran University of Medical Sciences, Tehran, Iran,
[2] Health Management and Social Development Research Center, Golestan University of Medical Sciences, Gorgan, Iran,
[3] Golestan University of Medical Sciences, Gorgan, Iran,
[4] Public Health Department, School of Health, Ardabil University of Medical Science, Ardabil, Iran.

Abstract

Objectives: the current survey aimed to investigate the motivational interviewing effects as a new technique compared to the usual care among hypertensive Iranian patients.

Methods: A randomized control trial was implemented. Participants of 140 were allocated in the two groups, randomly included motivational interviewing (intervention group) and usual care (control group).

Results: we found that intervention resulted in increase the total score and the mean score for all dimensions of the adherence questionnaire in the motivational interviewing group ($P < 0.001$), results also showed that systolic blood pressure and diastolic blood pressure significantly decreased in the intervention group after six month follow- up ($P < 0.001$).

Conclusion: Motivational interviewing seems likely beneficial to improve medication adherence, quality of life levels and blood pressure control in hypertensive patients.

Key words: Motivational interviewing, Hypertension, Medication adherence, Quality of life.

Introduction

Hypertension is one of the most leading risk factors of cardiovascular diseases (1). The recent status reports that hypertension is the first reason of mortality among non- communicable diseases and it is also the second burden of diseases all around the world which 1.5 billion patients will be affected by hypertension in 2025 year (2). In Eastern Mediterranean countries, hypertension is significantly increasing due to rapid socio-economic changes that reported 10 to 17 % in numerous surveys (3). In Iran, the prevalence of adult hypertension is 25 to 35 %(4). Lifestyle modification is the beneficial strategy to treat or prevent the effects of hypertension(5, 6). According to studies, unhealthy lifestyle likely increases the obesity, hypertension and cardiovascular diseases(7). Hypertension is the most leading cause of stroke and renal failure (8). Appropriate approaches are mandatory to increase patients' adherence to treatment. Previous surveys indicated that the traditional approaches for hypertension patients is not effective to improve patients adherence(6, 9). Miller (1983) developed a new method named motivational interviewing (MI) as an alternative to drinkers(6). MI is described as a client-centered, directive method to stimulate intrinsic motivation to modify behavior by using of exploring and resolving ambivalence (10, 11). The MI process in conductive to make communication between patients and healthcare providers and persuade patients to changes their behaviors (6). MI has broadly been used in health field with effective results (12). MI has recently been used in medical parts to augment the adherence to medication, dietary and physical activity of patients who have diabetes (13, 14). Chronic obstructive pulmonary disorders (15), hypertension (16, 17), HIV (18) and obesity (19). Ogedegbe et al. study showed the proper effects of MI for BP control among hypertensive patients(17). Woollard et al. also described that the MI group made notable decreases in BP patients compared to the control group (16). There is some exploration that showed more efficacies in MI than traditional methods (20-22). With regards to our studies, MI approaches are used in several investigations in Iran regarding a few issues except for hypertension, although its effect on tre-

atment adherence is not studied. Then it is needed to explore the effectiveness of MI in hypertensive patients in Iran.

Material and methods

The outcome measures included BP, treatment adherence, laboratory indicators, self-efficacy and quality of life.

Design and Intervention

Study design

A randomized controlled trial study was done, in total, 140 patients were enlisted in the usual care group (the control group) and the MI group (the intervention group). Patients in the control group provided by the usual care from a health care provider who worked at the health center, whereas those in the intervention group not only received usual care but also received MI from a psychologist. Hypertensive patients were employed from two health centers in the Gorgan city located in North of Iran. This survey was conducted from February 2014 to November 2014. The inclusion criteria were as follows 1) patients diagnosed with hypertension by a physician 2) patients who received one antihypertensive medication at least 3) patients who agreed to participate in the survey and more than 18 years; moreover, excluded criteria were as 1) pregnant women and being pregnant during the study 2) secondary hypertensive patients.

Study procedure

Sample enrollment

All hypertensive patients enrolled in the study that had health records in health centers and diagnosed by a physician. All common care was also provided by a staff who worked at health centers, that was qualified clinically. In total, 151 patients were asked to participate in the study that 11 of them lost, finally, 140 eligible patients agreed to participate.

Randomization

To allocate all of the 140 patients in the both groups (Control and Intervention group), randomly, eligible subjects were asked to select an envelope. The number one on the envelope was assigned to the control group, and the number two on the envelope contributed to the intervention group. All of the samples were blinded.

Outcomes measurement

In patients' enrollment time, baseline data were collected, and the second assessment was implemented in month 6. Identical questionnaires were completed by the two groups in two different times (baseline and 6 months after intervention). Final evaluation was done by health center staff who conducted the MI and usual care. The BP patients were previously selected based on existed health records that measured by health center staff using the same calibrated digital BP monitor in a seated position after 15 minutes of rest. Patients' laboratory values were collected by using of patient medical records after completing the first and second questionnaire.

Intervention

Motivational interviewing group

The counseling intervention was designed according to MI and social cognitive theory (23). MI was done through a psychologist who was authorized, each group ranged from 7 to 10 subjects that trained for 6 sessions over six months (45 to 60 minutes for each session). It focused on the behavior change of patients regarding regular physical activity, healthy dietary habits, smoking cessation, reducing stress and taking medication on time. The psychologist asked the participants to record their daily diary, adherence to medication, smoking, dietary habits, physical activity, illness perception, physical and mental health. MI session was implemented in the health center.

The standard (usual) care group

The content of this group included the recommendations and information in terms of change healthy lifestyle and adherence to treatment that conducted by a health center staff using a lecture and pamphlet about hypertension for six months (each session sized from 7 to 10 samples and was 30 to 45 minutes and1 session per month).

Instrument

Patients' sheet

It was about (1) demographic status (included age, gender, marital status, educational level and diagnosis duration). (2) The laboratory and clinical indices consisted of the systolic blood pressure (SBP), the diastolic blood pressure (DBP) and the triglyceride level and total cholesterol). (3) The symptoms of hypertension (dizziness and headache) and the complications of hypertension (coronary heart disease and diabetic nephropathy).

2.2.6.2. General Self-Efficacy Scale (GSES). Self- efficacy in our survey was assessed by the aforementioned scale. It includes 10 items that indicate to the perceived ability to overcome barriers and altercate with adversity. We used the Iranian version. The reliability and validity of the GSES was approved by Western researchers (24), Cronbach'α for the ten items ranged from 0.76 to 0.90 (6). Higher scores of this scale indicated higher self-efficacy.

2.2.6.3. Treatment Adherence Questionnaire of Patients with Hypertension (TAQPH). This questionnaire employed to evaluate the level of treatment adherence of patients (25). This test employs a 4-point Likert-type scale that consisted of 28 items categorized into six factors described as follows: diet, exercise, medication, weight control, stimulation and reducing stress. Higher scores mean better adherence to treatment. Overall Cronbach's α of the scale was 0.82 for the test-retest reliability.

2.2.6.4. Medical outcomes study 36- item short form (SF-36). This scale included 8 subscales and evaluated 8 fields of health, including general health, physical function, physical role, body pain, vitality, emotional role, mental health and social functioning. SF-36 was validated in previous explorations (26), the internal reliability of the Iranian version of the SF-36 was obtained with Cronbach's α ranged from 0.71 to 0.91 for 8 subscales. Higher scores implied better perceived health or functioning.

2.3. Data analysis

The sample size of our study was based on parameters included a powerful test of 90% (β= 90%) and P-value was taken < 0.05 as significant. According to our pilot study, a difference (3.89 ± 0.98) in the treatment adherence would be occurred in the intervention group compared to the control one. Therefore 120 samples were needed that by considering the attrition rate of 20%, 140 subjects were included in the study (70 samples in the control group and 70 subjects in the intervention group), finally. Collected data were analyzed using SPSS (version 13). To report baseline characteristics of the samples, a descriptive analysis was used. To test the variable's distribution, Skewness and Kurtosis tests were employed. Logarithmical transformation was used to assess variables that were not normal. To evaluate the difference within the subjects in the groups, the paired samples t-test was employed. The independent samples t-test was applied to test the difference between the MI group and the common care group.

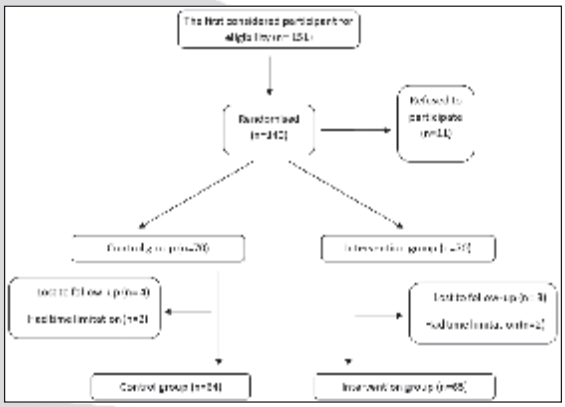

Figure 1. Consort diagram of the study

3. Results

3.1. Patient characteristics

In total, 140 hypertensive patients were explored in the two groups at the baseline. During the study (6 month), 129 subjects participated in total and completed six month follow up, 64 subjects in the control group and 65 participants in the intervention group. We missed 11 participants due to 1) 7 subjects were lost to follow- up 2) 4 of them had time limitation.

Baseline analyses showed that the mean of age of samples was 62 ± 12.43 years. Significant differences were not existed between the two gro-

ups regarding demographic characteristics (table 1). At the baseline, there was also no meaningful difference in the laboratory values and BP between the two groups. The vast majority of patients had no symptoms of hypertension; moreover, 6 patients had problems about hypertension (Table 1).

Table 1. The comparison of demographic characteristics of participants between the two groups at the baseline

Variables	Intervention group Group (n=64)		Control group Group (n=64)		t/x^2
	N	%	n	%	
Age Mean ± SD	62.35 ± 11.67		61.92 ± 13.12		0.73
Sex					1.40
Male	36	49.3	37	50.7	
Female	35	52.2	32	47.8	
Marital status					-3.01
Single	8	36.3	14	63.7	
Married	61	51.7	57	48.3	
Education					2.12
High school and below	34	61.9	21	38.1	
Diploma and higher	45	52.9	40	47.1	
Job					2.43
Employed	41	56.1	32	43.9	
Unemployed	29	43.3	38	56.7	
Duration of diagnosis					-2.01
< 1 year	12	17.4	14	19.7	
1	21	30.4	25	35.3	
3	25	36.2	27	38	
5	11	16	5	7	

Table 2. Differences of treatment adherence between and within the two groups at the baseline and after six months

TAQPH dimension		Baseline mean ± SD	Month 6 mean± SD	Paired samples t test (within samples) P	Independent samples t test (between samples) P
Dietary	1 2	22.76 ± 3.12 22.84± 2.91	24.21± 2.67 26.35± 2.92	0.072 0.032	0.024
Medication	1 2	23.41 ± 3.41 24.11 ± 3.21	26.02 ± 2.85 30.01 ± 3.22	0.063 0.041	0.011
Smoking	1 2	11.11 ± 2.23 12.32 ± 1.47	12.85 ± 2.43 15.29 ± 3.12	0.221 0.025	0.035
Control weight	1 2	6.21 ± 2.07 5.76 ± 1.04	7.12 ± 1.75 7.01 ± 1.21	0.091 0.065	0.062
Physical activity	1 2	3.92 ± 2.01 4.36 ± 2.11	4.65 ± 1.32 5.87 ± 1.67	0.321 0.024	0.014
Reducing stress	1 2	7.43 ± 1.45 6.01 ± 2.33	7.86 ± 3.01 7.94 ± 3.25	0.156 0.263	0.235
Total	1 2	74.84 ± 14.29 75.42 ± 13.07	82.71 ± 14.03 92.47 ± 15.39	0.432 0.002	0.013

1= control group, 2= intervention group.
P < 0.05

3.2. Treatment adherence

The mean scores and total scores of dietary habits, physical activity, smoking and medication treatment in the intervention group were higher than the control group after 6 months. According to Paired t-test, the MI group indicated increased dietary habits, physical activity, smoking and treatment adherence to medication between the baseline and after intervention (table 2).

3.3. Quality of life

The results of the SF-36 questionnaire revealed that total scores of the intervention group were higher than the control group after six months, there was a meaningful difference between the groups (table 4). The scores of general health, mental health, vitality and physical functioning augmented in the MI group, that indicated changes within the subjects in the baseline vs. post- intervention ($P < 0.001$).

3.4. Test values

The systolic blood pressure (SBP) and diastole blood pressure (DBP) decreased in the intervention group compared to the control group due to MI. The results also reported that BP decreased significantly in the intervention group after intervention, and a decrease in BP in the control group between the baseline and post- intervention. Although, laboratory indices were not significantly different between the two groups and within the samples in the groups (table 3).

3.5. Self- efficiency

The total score of this questionnaire in the MI group was higher than the standard group (usual care group), although this difference was not significant between the two groups and within the subjects ($P > 0.05$) (table 4).

Discussion

In our study, MI had positively impact on treatment adherence of hypertensive patients that these adherences (included lifestyle change and medication adherence) were based on previous studies (5, 6). Our findings revealed that the subjects in the MI group were more adhere to healthy lifestyle (such as physical activity and smo-

Table 3. Differences of values for intervention group and control group between and within group at baseline and month 6

Variables		Baseline mean ± SD	Month 6 mean± SD	Paired samples t test (within samples) P	Independent samples t test (between samples) P
SBP (mmHg)	1 2	152.31 ± 18.21 157.26 ± 19.32	147.43 ± 18.65 142.36 ± 20.35	0.052 0.022	0.021
DBP (mmHg)	1 2	81.23 ± 12.47 82.94 ± 12.54	78.83 ± 13.76 75.97 ± 14.25	0.064 0.015	0.032
TC (mmol/L)	1 2	4.21 ± 1.42 4.34 ± 0.84	3.89 ± 1.31 4.01 ± 1.12	0.425 0.671	0.341
TG (mmol/L)	1 2	1.63 ± 0.67 1.65 ± 0.81	1.72 ± 0.74 1.63 ± 1.63	0.564 0.573	0.753
FBG (mmol/L)	1 2	5.98 ± 1.32 6.02 ± 1.56	6.54 ± 1.42 5.87 ± 1.24	0.375 0.352	0.362
PBG (mmol/L)	1 2	8.42 ± 3.54 8.25 ± 2.89	8.53 ± 3.12 8.42 ± 2.51	0.412 0.345	0.646
LDL (mmol/L)	1 2	2.32 ± 1.32 2.30 ± 1.28	2.27 ± 1.37 2.25 ± 1.34	0.546 0.234	0.764
HDL (mmol/L)	1 2	1.34 ± 0.75 1.35 ± 0.56	1.32 ± 0.56 1.33 ± 0.43	0.732 0.327	0.432

1= control group, 2= intervention group. P < 0.05

SBP = systolic blood pressure, DBP = diastolic blood pressure, TC = total cholesterol, TG = triglyceride, LDL= low density lipoprotein, HDL = high density lipoprotein, FBG = fasting blood glucose, FBG = fasting blood glucose.

Table 4. Differences of psychological values for intervention group and control group between and within group at baseline and month 6

Variables		Baseline mean ± SD	Month 6 mean± SD	Paired samples t test (within samples) P	Independent samples t test (between samples) P
General health	1 2	79.45 ± 19.76 78.76 ± 19.37	81.34 ± 18.32 84.35 ± 19.17	0.327 0.035	0.021
Physical functioning	1 2	68.37 ± 13.43 69.23 ± 15.32	70.43 ± 27.21 73.32 ± 25.65	0.035 0.045	0.035
Role physical	1 2	67.32 ± 17.89 66.57 ± 23.43	68.21 ± 32.43 69.54 ± 31.34	0.231 0.414	0.062
Bodily pain	1 2	66.37 ± 20.34 67.65 ± 21.02	67.92 ± 17.32 67.01 ± 18.23	0.323 0.546	0.021
Vitality	1 2	72.02 ± 25.11 71.56 ± 24.76	74.21 ± 31.29 77.32 ± 29.34	0.071 0.032	0.036
Social functioning	1 2	87.21 ± 56.24 87.89 ± 45.32	88.24 ± 47.21 89.77 ± 45.78	0.324 0.065	0.025
Role emotional	1 2	75.23 ± 21.23 73.48 ± 22.65	75.67 ± 20.13 75.47 ± 21.08	0.167 0.683	0.454
Mental health	1 2	78.32 ± 54.12 77.81 ± 46.37	80.20 ± 49.98 83.71 ± 47.21	0.072 0.033	0.018
Self- efficiency	1 2	25.43 ± 4.23 26.51 ± 5.27	26.23 ± 5.76 28.21 ± 4.29	0.482 0.258	0.342
Total	1 2	619.72 ± 232.35 619.46 ± 223.51	632.45 ± 249.65 648.70 ± 242.09	0.632 0.547	0.325

1= control group, 2= intervention group. P < 0.05

king cessation), our results were associated with previous surveys that described positive effects of MI in adopting and implementing healthy behaviors (6, 19, 27) that its causes are that the samples were supported to develop and make their goals during the decision making process and to consider more than one solution, and also psychologist regard to integrate adherence manner into patient's daily routine(28, 29).

In our survey, patients in the MI group were more committed to medication treatment than the control group that is in accordance with Ogedegbe et al and Chunhua et al studies (6, 17). Our findings were in relevance with other surveys, in which patients with psychotic disorders, alcohol dependence, HIV and hypertension reported significant improvement in adherence of medication using MI counseling (6, 11, 12, 21, 29, 30).

MI counseling was also decreased SBP and DBP, it means that participants in the intervention group better controlled their blood pressure than the control group that were in relevance with Woollard et al. (16) and Ogedegbe et al. (17) and Chunhuan et al. (6). There were not significant difference regarding all the laboratory test variables between the groups and within the subjects in the groups that was associated with Chunhuan et al. (6), in which MI was not impact on laboratory variables included SBP, DBP, Scr, TC, TG, LDL, HDL, FBG and PBG.

According to QoL, MI in the intervention group led to better level of QoL than the control group. Four dimension of the SF-36 (general health, physical function, vitality and mental health) augmented in the MI group that is completely in accordance with Chunhuan et al. (6). In Brodiea et al. (31) study, MI had positive effects in promoting general QoL and disease- specific QoL for patients with chronic heart failure. With regards to aforementioned studies, MI can be a beneficial approach to improve the QoL in chronic patients.

According to self-efficacy, our findings are in accordance with Chunhuan et al (6) exploration, in which self-efficacy reveals the minimum changes

after 6 month of MI. Although, Brodiea et al. (31) study showed different results. This difference can be caused by different tools, because we use the general self-efficacy scale that poorly discriminate patient self-efficacy.

Limitation

Our exploration had some limitation as follows: (1) a self- report questionnaire was used rather than an objective tool that can be biased by false patient recall. (2) Psychologist and health center staff who implemented the MI and common care education was not blinded to the sample allocation.

Ethical statement

The study protocol was approved by the Golestan University of Medical Science (project no. 32756), Informed consent was completed by the patients before the study.

Conclusion

According to several studies, MI counseling positive effects have been approved and documented regarding quality of life, BP control and behavior adherence for chronic diseases (6, 11, 17, 31), our study also confirmed all aforementioned surveys. BP is prevalent in Gorgan city (North of Iran) that the current education and usual cares were not able to control that; then, an alternative and efficient behavior changes technique is needed that our investigation provides it in detail by recommending MI as an effective technique.

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Corresponding Author
Kamal Mirkarimi,
Health Management and Social Development Research Center,
Golestan University of Medical Sciences,
Gorgan,
Iran,
E-mail: k.mirkarimi@goums.ac.ir